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Eradication of Mediterranean Fruit Fly in Florida

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After seven months of continuous concerted eradication effort by the State and Federal Governments and the fruit and vegetable industries, the Mediterranean fruit fly (*Ceratitis capitata*) infestation has been practically eliminated in Florida. Although occasional flies are still being found, the trend in the numbers found each week is definitely downward. The area that originally supported fly populations has been reduced by more than 90 percent.

The Mediterranean fruit fly has been known to science for 135 years. It attacks a wide variety of hosts and has great potential for causing partial to complete loss of fruit and vegetable crops. In some countries where it is well established, fruit and vegetable growing is next to impossible without large yearly outlays of funds and facilities for control. Florida officials estimate that it would cost more than 20 million U.S. dollars a year to live with this pest. Florida produces 73 percent of all citrus fruit in the United States and 26 percent of the world's citrus production.

This pest invaded Florida and became established there in 1929, but it was completely eradicated at that time. Since then it has been intercepted at ports of entry 1,317 times. Because the Mediterranean fruit fly exists in the West Indies, Central America and the Hawaiian Islands, it had been feared that one day it would find its way beyond border stations and become established in the continental United States.

The flies are about two thirds the size of houseflies. The female generally selects fruit in the color-break stage to lay her eggs. The skin is pierced and several eggs laid underneath. The eggs hatch in one to two days. The larvae feed on the fruit pulp and mature in about ten days under Florida conditions. The larvae normally leave the fruit after it drops to the ground and quickly find a soft spot in the soil for pupation. Under normal Florida summer conditions they remain in the pupal stage nine to ten days. Cooler weather can prolong this stage several days.

The calamondin (*Citrus mitis*) and Surinam cherry (*Eugenia uniflora*) are two of the most favorable hosts in Florida. These have been especially troublesome because they are grown widely in the Miami area. Other high-ranking fruit hosts are peaches, guava, rose apple (*Syzygium jambos*), sapodilla, oranges, sour orange and grapefruit. Green peppers and ripe tomatoes are among the best vegetable hosts.

With the discovery of the fly in 1956, control officials had a choice of following two courses of action: either to seek complete eradication, which is an immediate, costly undertaking, or to inaugurate a control or suppression program requiring a large yearly expenditure for insecticides, fumigants, equipment, and manpower along with the associated cost for quarantine enforcement. There would be a direct loss of revenue from reduction of yield of marketable fruit and by embargoes imposed by uninfested States and foreign countries. With profitable production of fruits and vegetables at stake, it was logical to seek eradication.

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Immediate action was taken to initiate the eradication program. There were three important objectives:

1. to set up survey procedures to delimit the infestation;
2. to apply regulatory meausures to prevent spread to uninfested areas; and
3. to eradicate the fly in all known infestations.

Little time was lost in getting the program under way after the decision was made to eradicate the Mediterranean fruit fly. On 23 April extensive visual surveys were begun in the Miami area. Simultaneously, State regulations were invoked to prevent movement of host products from the infested area to other parts of the State, to other States, or to foreign countries. On 28 April the visual survey and inspection program was supplemented by trapping at high risk points, such as processing plants and recreational areas throughout the State. On 30 April the first eradication sprays were applied to the more heavily infested areas and on 7 May aerial spraying of outlying infestations was begun. On 16 May a federal quarantine was promulgated and procedures established to prevent the interstate spread. At that time federal funds were requested to assist Florida with the eradication and regulatory phases of the program. One month later large-scale aerial spraying was under way within the main eradication area.

An intensive survey program revealed early that at the time the Mediterranean fruit fly was discovered in the Miami area it was also established in several other parts of the State of Florida. General infestations were found, in addition to the one at Miami, in the Fort Myers, Tampa, and St. Petersburg areas. From them the fly had spread to other important fruit and vegetable areas of the State. The trapping program, using newly-designed plastic dry traps and the new angelica seed oil lure – the most powerful known to science – and liquid traps with ammonium chloride lure, was stepped up in all areas as facilities became available. DDVP (dimethyl 2,2–dichlorovinyl phosphate), an effective insecticide, was placed in the trap to kill the flies and a pinch of chlordane was used in each to repel ants. By the end of the year 45,000 traps were placed in strategic locations throughout the State to delimit infestations and to check on the efficacy of the bait spray program. Infestations eventually involved an area of 760,000 acres in 28 counties.

Control is accomplished by a bait spray formulation that attracts and then kills the flies. Both single and multi–engined aircraft are used for this purpose. Malathion, an organic phosphate deadly to the fruit fly but harmless to warm–blooded animals at the rates used, was mixed in water with protein hydrolysate, a food attractant for the Mediterranean fruit fly. This bait spray makes complete coverage of all areas unnecessary, since it draws flies to treated locations from adjacent untreated strips. The B–17 aircraft used was capable of spraying 180 acres a minute with the bait spray at the rate of one gallon per acre.

Bait spray applications are timed to the life cycle of the Mediterranean fruit fly. The flies start breeding six to ten days after emerging from the pupae stage. Since malathion kills for at least a week after application, spraying on an even ten-day schedule prevents reproduction of practically all adult flies in treated areas. Eggs and larvae inside fruits and pupae below ground, however, are untouched by this spray, so spraying must extend to cover the entire life cycle. Five or six scheduled sprays over a period of 50 to 60 days are believed adequate to cover this cycle.

Many obstacles can delay complete eradication, especially in heavily infested areas. Sudden showers that wash off spray residue soon after application, mechanical failures of spray planes, the difficulty of laying an accurate spray swath at high speed at low altitudes in variable winds – all these give the flies a chance of survival.

The sprays have been applied one or more times to the infested area of 760,000 acres. The area requiring control is reduced progressively on the basis of negative trapping for 90 days after the last adult is found, or 120 days after the last larva is found. By 31 December 1956, the aggregate acreage under treatment was only 60,000 acres as compared to a maximum of 760,000 acres originally requiring treatment.

Progress has made possible the removal of 14 of the 28 counties from the quarantine

regulations. In these counties all spraying and fumigation and certification of fruit has been discontinued. The regulatory procedures will be continued in the other 14 counties until the control requirements have been met. By the end of the year 258 fumigation chambers were in use to permit safe movement of fruit from infested areas. Ethylene dibromide is the fumigant in use.

Intensive trapping surveys will continue as a check on the effectiveness of treatment and to locate any new infestation. The 45,000 traps now in place throughout the State will remain until no trace of the Mediterranean fruit fly is found. Even after that time, systematic trapping will have to continue as a precautionary check for new arrivals of the Mediterranean fruit fly from outside sources.

Notes on Diseases of Fruit Trees in Iraq

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THE two diseases reported in the present notes, which appear to be previously unrecorded, were observed in Iraq during the past two years. Although their causes have not been determined, they seem to be worthy of further observation and reporting because of their usual symptoms.

Decline of Citrus

In January 1955, the writer's attention was called to a serious citrus disease in Nadhim Sadallah's orchard at Khanaqin, a town on the east frontier about 90 miles northeast of Baghdad. The orchard is a mature producing

Figure 1. A lemon tree showing defoliation probably due to virus infection, at Khanaqin, Iraq.

citrus orchard typical of the area under a protective cover of date palms. The disease was first observed by the grower about 1951 and by the end of 1954 it had eliminated the bulk of the orchard's production and most of the trees were either dead or dying.

The affected trees were mostly lemon. In addition, symptoms were observed on sweet and sour oranges and on a few tangerine trees. Those trees were said to be on lemon stocks, but it was difficult to identify any graft union in the trees examined. Propagation appeared to be done by cuttings in the local orchards. New commercial replants of sweet orange on sour orange stocks were young and had not developed this type of decline at the time of observation.

The leaves of the affected trees turned pale green, then yellow with no definite pattern. The trees defoliated irregularly, leaving only a few leaves scattered over the branches (Figure 1). This continued until the defoliation was complete (Figure 2).

Twigs looked normal even in the advanced stages of defoliation, but in the twigs and large limbs of diseased trees there was little or no starch. These large limbs eventually died and were cut back. Following the cutting off of main branches, the root suckers grew quite normally at first and starch was

Figure 2. A lemon tree showing complete defoliation probably due to virus infection, at Khanaqin, Iraq.

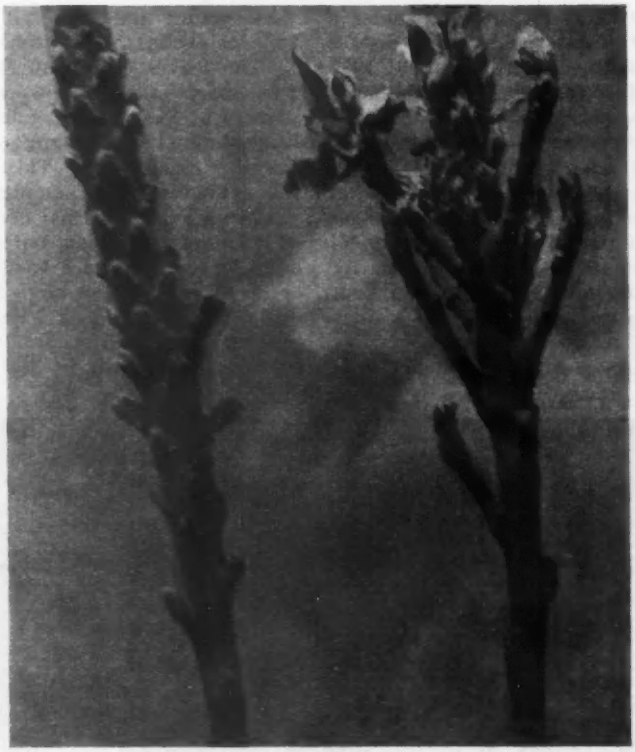

Figure 3. Current year's twigs from an apple tree grown at Taza, Iraq, showing an abnormally large number of buds and branches.

found in new suckers with leaves. Later those suckers showed typical symptoms and eventually defoliation and decline. The stems of diseased trees in some cases had an irregular growth in the cambium area. Sections showed little starch in pith, some starch in the xylem rays and very little in phloem rays, and other parts of the stem were nearly devoid of starch.

There was little new growth in defoliated or partially defoliated trees, but trees even completely defoliated were blooming at the regular time. Fruits were formed on diseased trees and ripened about the same time as those of healthy trees, but depending on the stage of decline the fruits became smaller down to the size of a walnut. No fruit was developed on the completely defoliated trees.

The roots appeared quite normal on the defoliated trees in the early stage of decline and there appeared to be relatively little root rot associated with diseased trees until the final stages of defoliation and decline. The roots, except the rotted ones, had abundant starch.

Many of the possible causes have been eliminated, such as nematodes and nonparasitic factors, including nutritional deficiencies, mineral toxicity, poor soil aeration, high water table and drought. It is also unlikely that the defoliation and decline are caused by root rot, because of the rapidity with which the disease spread while under observation and the little root injury found during the advanced stage of decline. The disease could be of virus origin and, if so, it appears to be unrecorded previously. The symptoms are very different from those caused by the tristeza or quick decline virus.

Big Stem of Apple

An apple tree was observed with swollen twigs with many buds in an orchard at Taza near Kirkuk, in the northeastern part of Iraq. The most evident symptom during the dormant season was the enlargement of terminals of the current year's twigs. Closer examination showed that this disorder had been recurring annually on the tree for a number of years.

In this affected tree there were many times more buds formed per unit length of twig than on a normal tree. The buds themselves seemed quite normal, except no flower buds were formed during the two years the tree was under observation. Some of the current year's twigs were profusely branched (Figure 3). The tree showed a strong tendency to hold leaves longer in the autumn than normal trees and failed to form terminal dormant buds on some branches.

In the spring the buds on this tree failed to open at the normal time. In fact, before leaves of this tree started to grow, other apple trees in the orchard were already in full foliage and forming terminal buds. Once the buds opened, however, the tree grew very rapidly and continued the growth until late fall. The terminal growth was equal to the better trees in the orchard and the color and development of leaves were normal.

Most of the apple trees grown in the central plains of Iraq do not normally break dormancy at the same time. It is not uncommon to see trees in bud and trees in fruit in the same orchard at the same time. However, the variation among individual trees in reaction to a mild winter and dormancy would not be of such an extent as described above with the tree showing swollen twigs.

The disorder may be due to the failure to break dormancy or it may be transmissible. Buds from the affected tree were grafted onto healthy apple trees at the Experiment Station at Abu Ghraib in the autumn of 1956 to determine its transmissibility.

Insect Pests in British Colonial Dependencies: A Half-Yearly Report [1]

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Malaya

LARVAE of *Limacosilla pirifera* Her. (Lep., Limacodidae) have been taken feeding on leaves of cacao. The species was described from Borneo and Sumatra, without mention of a food plant, in 1931.

The rice root aphid, *Rhopalosiphum rufiabdominalis* (Sasaki), is recorded as severely attacking experimental plants of padi grown in pots. This aphid has apparently not previously been recorded from Malaya. Its distribution is given in detail by DONCASTER,[2] who also determined the material from Malaya.

Nigeria

Lepidopterous stem borers continue to be the limiting factor in the production of maize in the south and of *Sorghum* in the north. *Sesamia calamistis* Hmps., *Busseola fusca* (Fuller) and *Eldana saccharina* Wlk. are the most important, in that order, on maize, and *Eldana*, *Sesamia*, *Coniesta* and *Busseola* on *Sorghum*.

A Pyralid, previously recorded as *Chilotraea* sp. nr. *africana* (Auriv.) (see *Rep. 6th Commonw. Ent. Conf.*, p. 297, 1954), that is now believed to represent an undescribed species of *Chilo*, has been reported as attacking rice stems at Badeggi, Niger Province.

The attack on yams (*Dioscorea* sp.) by *Heteroligus* spp. (Col., Scarabeidae) in the Niger delta (see *FAO Plant Prot. Bull.* *3* : 56, 1955) and the riverine areas of Eastern and Western Regions continues to be severe and is more widespread. It is the most important limiting factor in most yam-growing areas.

A termite, *Macrotermes* sp., is reported to be causing serious damage to the roots of young cacao trees in some marginal areas.

On cashew (*Anacardium occidentale*), attack by *Selenothrips rubrocinctus* (Giard) (Thysanoptera) on the foliage, and by *Helopeltis* sp. (Hemipt., Miridae), is becoming of increasing importance in the Eastern Region.

The species of *Phosphorus* (Col., Lamiidae) that was recorded as causing much damage to kola (*Cola* sp.) crops (see *FAO Plant Prot. Bull.* *4* : 64, 1956) has been determined as *P. virescens* (Ol.). It has been found boring in stems of *Cola acuminata*, up to two inches in diameter, in the Asaba Division of Benin Province. Reference may be found to this and other species of the genus in Weidner,[3] who gives the distribution of *P. virescens* as Belgian Congo, Dahomey, Ghana, Ivory Coast, Liberia and Nigeria, and quotes earlier authors who have recorded it as attacking *Cola acuminata* or *C. nitida* in Dahomey, French Guiana and Ghana. *P. gabonator* Thomson attacks *Cola* and has also been found boring in branches of cacao in the Cameroons.

In *Citrus* nurseries, budded plants for distribution in the Western Region have been severely attacked by the Coccids, *Chrysomphalus ficus* Ashm. and *Lepidosaphes beckii* (Newm.).

In the field of control, experimental work has been continued with sprays and dusts of *gamma* BHC against the cacao Mirids, *Sahlbergella singularis* Hagl. and *Distantiella theobroma* (Dist.). Large-scale trials have been promising, and are being taken up by some Nigerian farmers.

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[1] The present report covers the period from July to December 1956.

[2] DONCASTER, J.P., 1956. The rice root aphid. *Bull. Ent. Res.* *47* : 741-47.

[3] WEIDNER, H., 1938. *Phosphorus gabonator* Thoms. als Kakaoschädling und einige Bemerkungen über weitere schädliche *Phosphorus*-Arten (Col., Ceramb. Lamiin.). *Zeit. Pflanzenkr. & Pflanzensch.* *48* : 210-23.

Plant Disease Situation in the United States [1]

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Soybean Cyst Nematode: Further Notes on Occurrence

THE soybean cyst nematode, *Heterodera glycines* Ichinohe, was first found in this country in North Carolina (see *FAO Plant Prot. Bull. 3* : 74, 1955; *5* : 11, 1956). Recently its presence in Tennessee and Missouri has also been determined.

Tennessee

EPPS [2] reports that the nematode was found in soybean fields in Lake County, in the western part of the State. During a survey, soil and roots of soybean plants were collected from a field believed to be infested with the root-knot nematode. Examination of the soil revealed the presence of many lemon-shaped females of the soybean cyst nematode attached to the roots and in the soil. Larvae were present in the soil.

Soil samples sent to DR. J. N. SASSER, North Carolina State College, for confirmation, were found to contain viable cyst nematodes which attacked soybeans. Reproduction occurred readily and numerous males were found in the material.

The extent of the infestation has not been determined. The nematode was not found in the numerous soil and root samples collected later from the northern part of Lake County. The present known infestation appears to constitute a considerable acreage. The general area is devoted to growing soybeans, cotton, alfalfa and maize. The soil varies from very sandy to heavy.

Missouri

HAGGE [3] reports the occurrence of the nematode in southeastern Missouri. In December 1956, soil collections were taken from six soybean stubble fields in Pemiscott County, located across the Mississippi River from Lake County, Tennessee. Examination revealed the presence of numerous lemon-shaped cysts in one of the samples. Later the cysts were positively identified as those of the soybean cyst nematode.

Soil collections were also taken from 41 other fields planted to soybeans in 1956 in Pemiscott County. The soybean cyst nematode was determined in samples from eight of these fields, making a total of nine infested locations in Missouri.

The nine fields are all within one to five miles of the Mississippi River, in an area from three miles north of the Missouri-Arkansas line to 18 miles farther north. A laboratory has been established at Hayti, and surveys are being conducted to determine distribution of the nematode in Pemiscott County and elsewhere in Missouri.

Striga Reported in South Carolina

The first discovery of the presence of the parasitic flowering plant *Striga* in the Western Hemisphere was reported recently (see *FAO Plant Prot. Bull. 5* : 47-49, 1956). It was found in maize fields in southern North Carolina.

HOLDEMAN [4] now reports *Striga* from adjacent South Carolina, where its occurrence has drastically reduced maize yields and in some cases destroyed crabgrass (*Digitaria*).

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[1] This report is based upon material submitted by Collaborators of the Plant Disease Epidemics and Identification Section, Agricultural Research Service, United States Department of Agriculture.

[2] EPPS, J.M., 1957. Soybean cyst nematode found in Tennessee. *Plant Dis. Reptr. 41* : 33.

[3] HAGGE, A.H., 1957. Soybean cyst nematode in Missouri. *Plant Dis. Reptr.* (in press).

[4] HOLDEMAN, Q.L., 1957. Striga reported in South Carolina. *Plant Dis. Reptr. 41* : 133-34.

As observed, *Striga* varied in height from 2 to 15 inches, with numerous erect branches. Color of foliage and stems varied from dark green to " nitrogen-deficient " green. Leaves were linear, tapering to a point and curving downward. The leaves were alternate on a square stem, occasionally lower leaves being opposite. Individual leaves tended to die as the sessile seed capsules in the axils matured. In contrast the stems remained green until the entire plant died. The flower was tubular, with a well-developed two-lipped corolla 5 to 11 millimeters in diameter, cardinal red on the upper surface with a straw-yellow eye, and straw-yellow on the lower surface, frequently with a pink tinge. Seeds were numerous, minute, brown, less than ¼ millimeter long and readily passing through a standard 40-mesh sieve.

This parasitic plant has been observed in tobacco and cotton fields where crabgrass grew, but only maize and crabgrass were damaged by it. The extent of damage to maize was not always correlated with the abundance of *Striga* plants in the field.

Striga was first observed in August 1951 on a farm in Horry County, but was not identified and its possible causal association with stunting of maize was obscured by nematode injury. The parasitic plant was next encountered in August 1956, during examination of a Dillon County maize field.

Outbreaks and New Records

Republic of the Philippines

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Expanded Technical Assistance Program, FAO

Bunchy Top of Abaca

DURING field surveys in November 1956 at the Guinobatan Experiment Station, which is located at the head of Albany Gulf near the southeast end of the Island of Luzon, the writer encountered a form of the bunchy top disease in the Itom and other varieties of abaca (*Musa textilis*). This form of the disease is the chronic, partially recovered type which the writer[1] studied in 1946 and 1950 in the abaca estates formerly established by the Japanese in North Borneo. The disease did not appear to be doing much obvious damage to the Itom variety, but in other varieties it was causing some hills to be very weak in growth. In addition to Itom, the varieties Inagutag, Borogtonon, Degoma, Inisarog, Bulao and Ugarom were found to be infected.

The presence of this chronic form of bunchy top at Guinobatan had previously been undetected, although it was reported that the more easily recognized acute form of the disease occasionally occurred in a block of hybrid abaca, which is across the road from a chronically infected Itom block. In North Borneo the chronic form of bunchy top has been responsible for heavy losses, apparently due to its reversion to the rapidly spreading acute form, with which heart rot is associated.

At the Southern Mindanao Regional Station, Bago Oshira, Davao City, bunchy top was also encountered in the Tangongon variety. Its presence at this station was previously known, since affected hills are often found in abaca blocks not far from the research laboratories. The writer was informed by MR. P. O. PACCAMBACA, Fiber Technologist, that these outbreaks are thought to be related to the importation from Luzon, about 1950, of rootstocks of a hybrid variety, which was reported to be resistant to bunchy top. These rootstocks were planted in a plot near the research laboratories, and in 1953 there was a severe outbreak of acute bunchy top in this plot, causing it to be eradicated.

[1] MAGEE, C.J., 1953. Presidential address: Some aspects of the bunchy top disease of banana and other *Musa* spp. *Jour. Royal Soc. N.S.W.*, *87* : 1-18.

United States

Plant Pest Control Branch
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United States Department of Agriculture

European Corn Borer and Grasshopper Outlook

HIBERNATING populations of the European corn borer, *Pyrausta nubilalis* (Hbn.), are not as heavy as in the winter of 1955/56 according to larval surveys. For the 27 States surveyed, the average number of borers decreased from 147 per 100 plants in 1955 to 105 in 1956. The major decline in populations is in the important maize areas of the North Central States. However, several of the Eastern States show increases. This major pest of maize, which was first

found in this country in Massachusetts in 1917, is now known to occur in 37 States.

The grasshopper threat to western and midwestern agriculture remains about the same as in 1956. More than 22 million acres of rangeland in 19 States in that area may have light to very severe grasshopper damage in 1957. In addition, control measures may be necessary to protect crops in many of these areas. In 1956 more than 2 million acres of grasshopper-infested rangeland were treated.

Plant Quarantine Announcements

Republic of the Philippines

Administrative Order No. 3 of 4 January 1956 is a revision of the Order of 3 October 1946. By the revised Order, the use of rice, rice straw, rice chaff, coconut, sugar cane and bamboo leaves, dried grass and weeds and other plant materials for packing, tying or filling merchandise and personal belongings imported into the Philippines is prohibited, unless such materials are in manufactured form, such as mats, strings, slippers, bags, etc.

Regulations governing the importation of plant materials of the genus *Musa*, coconut, sugar cane, rice, pineapple, bamboo, tobacco, citrus varieties Chinese Yellow and Red Kids, maguey (*Agave cantala*) and sisal (*A. sisalana*) remain the same. The importation of these plant materials, including living plants, seeds and all other parts of plants, is strictly prohibited, except for certain specific purposes. For the supply of new varieties and propagating stocks, a limited quantity of such plant materials may be imported through the port of Manila from countries or places which maintain plant quarantine services under permit of the Director of the Bureau of Plant Industry. Such plant materials may also be imported for experimental purpose only, in limited quantities, from countries and places not maintaining plant quarantine service, subject to conditions imposed by the Director of Plant Industry and post-entry quarantine.

Territory of Papua and New Guinea

Quarantine (Plants) Regulations (Regulation No. 37 of 1956), dated 18 October 1956, are divided into four parts:

Part I – Preliminary
Part II – Provisions for Importation and Inspection
Part III – Conduct of a Plant Quarantine Station
Part IV – Miscellaneous

In part II, the following main provisions are included:

Inspection and treatment. All imported plants and imported packages or consignments containing plants are subject to inspection at the port of entry and, when found infested or infected, will be treated, detained for quarantine, reshipped, destroyed or otherwise disposed.

Certificate for health. Each consignment of plants must be accompanied by a certificate issued by an authorized officer of the country of origin, certifying that the plants were examined and found free of diseases and pests of any kind. The certificate should be in the prescribed form (similar to the model certificate annexed to the International Plant Protection Convention, with further statement on field inspection) and should contain additional information relating to the origin or treatment of the plants and the presence of diseases or pests of the crops concerned in the country of origin.

Import permit. Plants may not be imported or brought into the Territory without a permit, application for which must be made in prescribed form to the Chief Quarantine Officer at Port Moresby. In the case of plants or seeds intended for planting, a permit will be issued only for the importation of a minimum quantity necessary to establish, under quarantine, the particular species, variety or strain of plants.

Packing material. Soil, foreign vegetable matter, compost, grass, hay, chaff, seed hulls, leaves or twigs, bark or forest litter are not permitted to be used for the packing, filling or wrapping of imported plants and goods. Plants should be packed or contained in clean new packages or containers of any kind, not previously used for any purpose. Packing materials are subject to treatment or destruction.

Non-propagating material. Imported seed or other plant material not for sowing will be treated on arrival to destroy the viability of the seed, diseases or pests or to meet other phytosanitary requirements.

Living insects and parasites. The importation of living insect, pest, parasite or vector at any stage of development either with or without plant material is prohibited unless permitted in writing by the Chief Quarantine Officer.

Fodder with imported animals. Fodder, hay, chaff, straw or litter landed with imported animals is subject to treatment necessary to prevent the introduction of plant diseases and pests.

Timber. The importation of any timber, whether in the form of logs or sawn timber, is prohibited unless the Collector of Customs at the port of entry has been given notice in prescribed

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form seven days before the date of arrival. The notice should be accompanied by a certificate issued by an authorized officer of the country of origin stating that:

a) in the case of logs, that immediately prior to shipment, the logs were inspected, free of bark (with the exception of turpentine, *Syncarpia laurifolia, S. lillii*, for poles), considered free of live borers and pests, and treated with creosote (1 gal. per 150 sq. ft. of log surface) or other approved insecticides; and

b) in the case of sawn timber, that it was inspected at the mill or immediately prior to shipment and found to be free of live borers and pests, and that *Lyctus* susceptible timber was subjected to an approved treatment.

The Second Schedule appendixed to the Regulations specifies the prescribed means and methods for the fumigation or other treatment of plants, packages or goods.

Thailand

1. Plant Diseases and Plant Pests Quarantine Act, B.E. 2495, was made in 1952 but, due to the length of time required for the preparation for its execution, came into effect only on 10 June 1956. The Act empowers the Minister of Agriculture to issue notifications for the prohibition of the importation of any kind of plants and to designate quarantine areas during serious outbreaks of plant diseases or pests. The Director-General of Agriculture or other authorized officers are empowered to inspect, treat, detain for quarantine and destroy the plants destined for import or export. Plants for export may be inspected and phytosanitary certificates may be issued upon request. The removal of plants from a customs or quarantine station can be effected only by permission in writing from an authorized officer. Plants subject to the provisions of the Act are to be determined by Ministerial Regulations.

2. Ministerial Regulation (B.E. 2499) of 3 June 1956 declares that the following plants are subject to the Plant Diseases and Plant Pests Quarantine Act: rice (*Oryza* spp.), rubber (*Hevea* spp.), sugar cane (*Saccharum* spp.), coffee (*Coffea* spp.). Explanatory Notification issued by the Department of Agriculture determines further that the importation of these four plants is prohibited, including:

a) rice seed, seedlings, plants and parts thereof, including the parts used as packing materials and in the form of mats, ropes, sacks, etc., unless they have been disinfected and disinfested by dyeing;

b) rubber seed, cuttings, stocks, and any other parts of the plants which may be used for planting;

c) sugar cane seed, seedling, cuttings and any other parts of plants which may be used for planting;

d) coffee berries, seedlings, plants and parts of plants which may be used for planting, excluding raw coffee berries which have been prepared for roasting.

3. Ministerial Notification of 4 June 1952 declares the Bangkok Quarantine Station (for the Bangkok customs area) and the Songkla Quarantine Station (for the Songkla, Sadao and Padang Besar customs areas) as the points of entry for imported plants.

4. Ministerial Notification of 5 June 1956 designates officers responsible for the administration of plant quarantine legislation.

5. Notification of the Department of Agriculture of 8 June 1956 establishes rules and procedures for the application for and issue of export phytosanitary certificates.

U.S. Trust Territory of the Pacific Islands

Executive Order No. 58 of 5 June 1956 amends Executive Order No. 23 of 4 March 1952, providing general procedures for the enforcement of plant and animal quarantine control and authorizing the Staff Entomologist to issue Plant and Animal Quarantines and relevant regulations.

Under the power of the Executive Order, Quarantine Nos. 1-9 and Plant and Animal Quarantine Regulation Nos. 1-5 were approved on 6 September 1956 and were issued by the Staff Entomologist. The new legislation supersedes all previously issued laws, regulations, and quarantines relating to plant and animal quarantine and contains the following provisions governing the importation of plants and insects into the Territory:

1. Living insects, snails, and other lower forms of animal life are prohibited to be imported into the Territory, except those authorized by the Staff Entomologist for experiments or biological control, and except domesticated bees which are enterable under permit (Quarantine No. 1).

2. Fruits and vegetables, which are not preserved or processed, are prohibited entry, except those from the continental United States and certain items from the following countries (Quarantine No. 4):

Japan and Formosa. Celery, chives, garlic, leek, onions, arrowroot, asparagus, burdock, taro, ginger root, horseradish, lettuce, potatoes, radish, cabbage, Chi-

nese cabbage, waterlilly root, yam bean root, grapes, pears, turnip, Irish potatoes.

Philippines. Celery, chives, garlic, leek, onions, Irish potatoes, ginger root, cabbage.

Hawaii. All fruits and vegetables if treated in the same manner required for entry to the continental U.S.A. and accompanied by certificate.

Fruits and vegetables from other parts of the world and additional fruits and vegetables from the countries listed above are permitted to enter only under written permission of the Staff Entomologist (Regulation No. 3).

3. Living plants and parts thereof intended for propagation may be imported under permit (Quarantine No. 5) except the following, the importation of which is prohibited:

a) lantana (*Lantana camara*), plants and parts of plants;

b) cacao (*Theobroma cacao*), plants and parts thereof capable of reproduction, except under special conditions (Regulation No. 4).

4. Coconut plants, parts thereof and coconuts, except husked coconuts and methyl bromide fumigated unhusked coconuts, are prohibited entry into the Territory (Quarantine No. 6 and Regulation No. 4).

5. Soils, including compost and soil around the roots of plants, are prohibited entry. Clean ocean or quarry sand and certified sterilized soil are exempt from this prohibition (Quarantine No. 7).

6. Forest litter, sugar cane stalks, coconut fronds, grasses or any other unprocessed plants or parts thereof used as packing material are prohibited entry. The use of mature rice straw for packing is permitted (Quarantine No. 8).

In addition to the above, Quarantine Regulation No. 1 provides that inspectors will be appointed for the areas of Majuro, Ebeye, Truk, Rota, Palau, Yap, Ponape and Kusaie and, when agreements are reached, quarantine collaborators will be appointed in Kwajalein, Ulithi, Guam, Angaur, Saipan, Tinian, and Eniwetok-Bikini. Regulation No. 2 deals with the issuance of and application for plant and animal quarantine permits. Quarantine No. 9 and Regulation No. 5 provide for the predeparture inspection of any air or surface vessel moving within the Territory for the purpose of preventing the spread of the Giant African Snail (*Achatina fulica*) and the rhinoceros beetle (*Oryctes rhinoceros*).

News and Notes

Plant Protection Committee for South East Asia and the Pacific

The Plant Protection Agreement for the South East Asia and Pacific Region, which has been signed and adhered to by ten governments, came into effect on 2 July 1956. In pursuance of the provisions of the Agreement, a Plant Protection Committee for the Region was established by FAO to serve as an advisory body to participating governments on matters relevant to the Agreement and to consider plant protection problems requiring co-operation on a regional basis.

The first meeting of the regional Committee took place at Bangkok, Thailand, 3-7 December 1956, and was attended by representatives of nine governments and an observer from the South Pacific Commission. Existing plant quarantine activities in the participating countries, with special reference to organizational aspects, facilities available and legislative provisions were reported by their representatives. A legislative basis adequate for the implementation of the regional Plant Protection Agreement and the recommendations of the Committee exists in all these countries and several governments are improving their quarantine facilities required for the enforcement of the legislation.

As provided in the regional Plant Protection Agreement, hevea rubber plants imported into the Region from any country, where South American leaf blight (*Dothidella ulei*) is present, must be grown for an adequate period at an intermediate quarantine station in order to prevent the introduction of this disease. The representatives of Australia, the Netherlands, the United Kingdom and the United States reported to the Committee that their governements agree to make such intermediate quarantine facilities available to participating governments for materials required for research purpose.

Appendix A of the Plant Protection Agreement, which contains a list of destructive pests and diseases not yet established in the Region and requiring particular attention in quarantine enforcement, was considered by the Committee and was modified in accordance with the current knowledge on the geographic distribution of plant pests and diseases. The Committee also made recommendations on measures to be adopted for regulating the importation and movement of certain crops of particular importance, including cacao, for which detailed measures to prevent the introduction and spread of several dangerous diseases were determined.

The Committee elected DR. T.H. HARRISON as its Chairman and FAO will provide a technical officer to serve as the secretary. A standing subcommittee was established to keep under review current developments in connection with the incidence of plant diseases and pests which could constitute a threat to important crops in the South East Asia and Pacific Region.

International Congress of Crop Protection

The Fourth International Congress of Crop Protection will be held in Hamburg, Germany, 8-15 September 1957. The second information circular issued by the Congress office indicates the scope of deliberations to cover the following main subjects:

a) Fundamental research: diseases, causal agents, pests.
b) Phytotherapy (control of diseases and pests).
c) Protection of stored products.
d) Technique of crop protection (equipment).
e) Plant quarantine.
f) Organization of crop protection and legal regulations.

Any inquiry with regard to the Congress should be made to the Congress office at the following address:

Biologische Bundesanstalt für Land- und Forstwirtschaft
Messeweg 11/12
Braunschweig, Federal Republic of Germany

Roma - Tip. del Senato del dott. Giovanni Bardi